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PIGOU'S WEALTH AND WELFARE

Six years ago, in a review of the fifth edition of Marshall's *Principles of Economics*,¹ Professor Pigou said: "The conception of the National Dividend is not an academic toy, but a practical instrument of great power designed for service in the concrete solution of social problems." This statement accurately defines the purpose, scope, and method of Professor Pigou's new book.² Its spirit, like that of Marshall's great treatise, is one of sane conservatism, tempered by an attitude of open-minded receptivity toward such new proposals as seem to stand the test of careful analysis. Yet the boldness of Professor Pigou's theoretical analysis and the fact that the practical problems he discusses are suggested, for the most part, by very recent proposals for social reform give to his book a distinctly fresh and unconventional flavor.

The book will find an audience more limited, I fear, than it deserves on its merits. No one not thoroly familiar with the concepts and technical apparatus of Marshall's *Principles* will be able to read it intelligently. Moreover, altho Professor Pigou writes in a simple and straightforward fashion, he possesses neither an especially attractive style nor any marked skill in exposition. The argument is well ordered, but the whole discussion is closely knit and the subject matter full of inherent difficulties.³ Mathematical formulae

¹ *Economic Journal*, Dec., 1907, vol. xvii, p. 532.

² *Wealth and Welfare*, by A. C. Pigou, M.A. London: Macmillan and Company, 1912. pp. xxxi, 493.

³ Professor Pigou rightly observes (p. 487): "It is a popular delusion, that, while economic science itself is a difficult subject, the discussion of practical problems, in which economic forces play an important part, can safely be undertaken without special preparation. There is no warrant for this view. The study of economic theory is, indeed, difficult; but the application of the knowledge, which that study wins, to the guidance of practical affairs, is an even heavier task; for it needs, not only a full understanding of the theory, but also the trained judgment that can balance against one another a large number of qualifying considerations. This would be the case, even if human life were such that economic welfare and welfare in general were coincident terms."

are used sparingly (tho skilfully) and are relegated to the footnotes.

In the formal discussion of his premises the author posits a sophisticated sort of utilitarianism, in which welfare is held "to include states of consciousness only," and *economic* welfare appears as the "psychic return of satisfaction." Grounds of dissent from both the psychological and the ethical implications of these theses suggest themselves, but are not worth stating: first, because Professor Pigou hedges his doctrines about with so many safeguards that the really vulnerable points are, at most, few; and, secondly, because these debatable points play but a small rôle in the general argument and conclusions of the book. In fact, save for a carefully guarded statement of the familiar doctrine that a transference of shares in the dividend from the rich to the poor will, *ceteris paribus*, increase the sum total of satisfactions, he deals only incidentally with the subjective aspects of wealth. The difficult questions connected with the meaning, variations, and practical significance of consumers' and producers' surpluses are for the most part disregarded, altho these are questions which Professor Pigou has shown himself peculiarly competent to discuss.

The chief task which Professor Pigou sets himself is the discussion of the effects of different forces upon the magnitude and stability of the *national dividend*, — which is conceived (after Marshall) as identical with the net annual product of such commodities and services as are measurable in terms of money value.¹ Even with so concrete a concept Professor Pigou cannot entirely escape the old familiar dilemma that confronts the utilitarian when "greatest good" and "greatest number" seem to point in opposite directions. For ex-

¹ Professor Fisher's concept of a dividend consisting only of such services of goods (and persons) as enter directly into consumption within the year is appreciatively discussed, but dismissed as unmanageable for the purpose in hand. In the opinion of the reviewer, when questions relating to the magnitude and effects of *savings* are involved, much is to be gained by distinguishing the "annual dividend" (conceived as the valuable goods and services coming into the possession of ultimate consumers within the year) from the "annual product," which includes (in addition to direct personal services) the results of all that is done within the year in forwarding goods, directly and indirectly, toward completion.

ample, after showing clearly that an increase in the supply of the factors of production, other than labor, is likely to increase both the national dividend and the aggregate real earnings of labor, he examines the effect of an increase in the supply of labor itself and concludes¹ that, since the elasticity of the demand for labor is high, and since an increase in the population (of England) would affect the price of imported food supplies but slightly, "the diminution of real wages per head would be very small;" and that, consequently, "it seems reasonable to conclude that an increase in the absolute share of labor, even when it results from an increase in the number of the population, carries with it an increase in the economic welfare of working people." Surely this is enough to show the need of a more clear cut conception of what "economic welfare" really is.

In general Professor Pigou's treatment of the population problem is the most unsatisfactory feature of his work. It seems less thoro and candid than the other parts of his analysis. There is, it is true, an admirable chapter on "The National Dividend and the Quality of the People," dealing with the claim of some of the apostles of Eugenics that economic inquiries, concerned as they are in the main with environment rather than heredity, are relatively unimportant. I know of nothing on this topic more incisive than this chapter, with its summary statement: "Environments, as well as people, have children." But the fundamental questions relating to the *quantity* of the laboring population Professor Pigou, it may fairly be said, neglects or evades. The economic tendencies with which he deals are "long-time" tendencies, but nevertheless distinctly limited either in duration or scope. He postulates (implicitly) mobility of capital, of employing power, and of "uncertainty bearing" (save where monopoly prevents), and takes account of such movement of labor as its degree of mobility permits from industry to industry, from locality to locality, and even, in some slight degree (fitting English condition), from one country to another. But the effect of large population

¹ P. 94.

movements either in place or in time, such as are shown in American and Australian immigration or were postulated as the basis of the Ricardian theories relative to "long-time" tendencies are comparatively neglected. It is doubtless true that, as Professor Pigou argues,¹ an increase in the dividend, not itself caused by an increase in the supply of labor, will not be *entirely* absorbed by an increase of population.² But, in relation to some of the economic proposals discussed in the book, such as the establishment of a national minimum (conceived as a minimum standard of living conditions) the population question remains of fundamental importance.

The general run of the introductory part of Professor Pigou's carefully articulated argument is to the effect (1) that whatever increases "economic welfare" will in general increase "total welfare," (2) that whatever increases the magnitude of the national dividend, or decreases its variability, or increases the absolute share of the relatively poor, is likely to augment economic welfare. Despite his attempt to confine his own analysis to "economic welfare," which, it will be remembered, is defined in terms of subjective "satisfactions," Professor Pigou, like every other sensible person who has dealt with the subject, is forced to take some account of the obvious fact that some of the "satisfactions" people want are injurious to themselves or to others.³ His device for maintaining logical consistency is that adopted by Dr. Marshall and others: some expenditures diminish the sum total of satisfactions by adversely affecting the physical health and vigor of the people and thereby diminishing the future national dividend. Simi-

¹ Pp. 28-32.

² Professor Pigou possibly gives too much weight to Brentano's conclusions relative to the effect of the increased prosperity of any social class in diminishing the birth-rate. This matter has been carefully surveyed by K. Oldenberg in the *Archiv für Sozialwissenschaft und Sozialpolitik*, vol. xxxii, pp. 319-377; xxxiii, 401-499. See also the controversy between Oldenberg and Mombert in the same journal, vol. xxxiv, pp. 794-797. After all, however, the problem centers around the net increase of the population rather than the birth-rate. On this point the general experience of the last century (in England, as well as elsewhere) has been so explicit that Professor Pigou's failure to deal seriously with the problem is hard to defend. Cf. Ely, *Outlines of Economics*, rev. ed., pp. 373-376.

³ See, for example, pp. 163, 165.

larly, public expenditures for education, sanitation, and the like, are justified as tending to increase the national dividend and (indirectly) the sum total of satisfactions. All this is along familiar lines, and I would not mention it here, if it were not that, in my opinion, complete logical consistency demands either a thoro and consistent recognition of the varied relations of present "satisfactions" of *all kinds* to efficiency in future production, or, better, an abandonment of the "satisfactions" conception of economic welfare. But Professor Pigou, as I have already said, deals mainly with a national dividend of concrete goods and services, and no one, whatever his philosophy of economic welfare, can question the fundamental importance of such a study.

Professor Pigou discusses two general classes of concrete problems: first, the conditions of business organization and control under which the dividend is a maximum; second, the way in which the dividend and, consequently, real incomes are affected by attempts to improve its distribution.

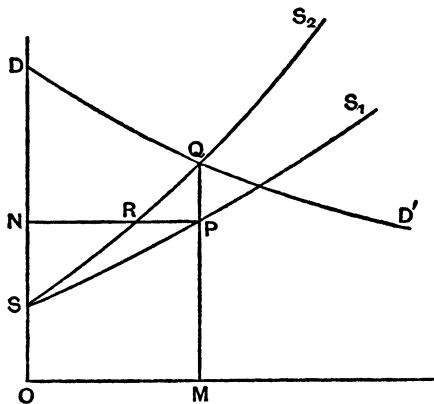
In the first of these two general studies Professor Pigou introduces a new and powerful instrument of economic analysis, the *curve of marginal supply prices*,¹ which might with equal accuracy and greater simplicity be called the curve of aggregate expenses. His own account of this curve is, I think, so abstract and general as to suggest imaginary difficulties to the reader. I shall venture, therefore, to describe what I take to be the principles involved in somewhat simpler terms.

The facts to be observed are those connected with the increase of the *aggregate expenses* of an industry as a whole. These must be distinguished from the general fact of the diminishing productivity of the particular factors of production and also from the tendency to diminishing (or constant, or increasing) returns per unit of expense as the size of the individual business unit increases. Furthermore, we do not have in mind precisely the same thing as when we

¹ Also described in Professor Pigou's article on "Producers' and Consumers' Surplus," *Economic Journal*, vol. xx, pp. 358-370.

speak of diminishing (or constant, or increasing) returns in a given industry as a whole during a period of time; altho the basic facts involved in both conceptions are in part identical. Take, for example, an industry of diminishing returns, say wheat growing. By "diminishing returns" we mean, of course, to imply that if an aggregate annual product of x units of wheat is increased to an annual product of $x + \Delta x$ units, more capital and labor per unit of product must be "applied to the land" to produce the Δx units than were required to produce the final increments of the original x units.

Now the fact of present importance is that, through the rise of land rent (and possibly, also, through an increased expense per unit for labor and capital, caused by the increased demand) the *aggregate expenses*, including land rent, of producing $x + \Delta x$ units will exceed the expenses of producing x units by much more than the expenses specifically attributable to the production of the Δx units. The curve of aggregate expenses, or of "marginal supply prices," as Professor Pigou prefers to call it, is so constructed that as successive increments of product are measured on the horizontal axis, the successive ordinates represent the amounts by which aggregate expenses are increased. Thus, in the accompanying diagram, the area inclosed by the curve (SS_2), the two axes, and the ordinate at any point M represents the



aggregate expense of producing OM units of product. For industries of diminishing returns the curve has a positive slope, which is greater than the slope of Dr. Marshall's "particular expenses" curve or that of the ordinary long period competitive supply curve as used to represent conditions of diminishing returns.

In similar fashion the curve of aggregate expenses may be used to describe conditions of increasing returns. In this case the aggregate annual expense of producing $x + \Delta x$ units exceeds the aggregate annual expense of producing x units by *less* than the amount of expense that can be specifically attributed to the production of the additional Δx units. I imagine, however, that cases of increasing returns in this sense (*i. e.*, diminishing aggregate expenses per unit of product as production increases) must be rare, if not altogether lacking, in competitive industry, unless an increase in the size of the representative establishment be taken into account as a natural concomitant of increased production in the industry in question.¹ For monopoly, where one undertaking is identical with the "industry at large," the curve of diminishing aggregate expenses has real significance.

Contrasted with the curve of aggregate expenses is the ordinary long period supply curve, *i. e.*, the curve for which the ordinate at any point M represents the price which, in the long run, tends to maintain an annual output OM. Since, under competition, the receipts in a given industry tend to equal the total expenses (including the rent of land and payment for any other differential advantages), and since, furthermore, each unit of a given product must be supposed to be sold at the same price as any other unit, it follows that the total receipts for OM units (represented by

¹ The economies of large scale production affect industry at large (if competitive) only by reducing the expense per unit in individual establishments. It is scarcely logical to treat these economies in the same general manner as the increasing expense of agricultural production, which arises from causes external to the individual undertaking. Professor Pigou says (p. 177): "Provided that certain external economies are common to all the suppliers jointly, the presence of increasing returns in respect of all together is compatible with the presence of diminishing returns in respect of the special work of each severally." I cannot imagine "external economies" adequate to bring about this result.

the rectangle OMPN where SS_1 is the supply curve) must equal the amount of expenses represented by the area OMQS.¹ That is, the area PRQ is equal to the area SRN. "It follows that, when SS_1 is a horizontal line, SS_1 and SS_2 coincide: when SS_1 is inclined positively, SS_1 lies below SS_2 : when SS_1 is inclined negatively, SS_1 lies above SS_2 . Furthermore, the rapidity with which SS_1 and SS_2 diverge from one another, as they move towards the right, is greater, the sharper is the inclination of SS_1 in either a positive or a negative direction."²

We are now equipped to examine the use to which Professor Pigou puts this new construction. Here we may advisably follow his own exposition:³

Under simple competition — where the output of each supplier is so small that he accepts, and does not attempt to modify, the price of the market — the exchange index necessarily stands at the point of intersection of the demand curve with the supply curve, and the output is such as to correspond with this position of the index. Hence, the actual output tends to be equal to the ideal output when the supply curve and the curve of marginal supply prices coincide, and it tends to diverge from the ideal output when these curves diverge from one another. This implies that the measure in which the actual and the ideal output of any industry approximate to one another is determined by the measure in which the supply curve and the curve of marginal supply prices approximate towards one another.

. . . . The general result is that, in industries of constant returns, the supply price and the marginal supply price of all quantities of output are equal; in industries of increasing returns the supply price is greater than the marginal supply price; in industries of diminishing returns the supply price is less than the marginal supply price. This result is, of course, equally valid, whether the supply price and marginal supply price in question refer to an operation yielding a single product or to one yielding several products jointly. It follows that, other things being equal, in industries of increasing returns the marginal net product of investment tends to exceed, and in industries of diminishing returns to fall short of, the marginal net product yielded in industries in general. Furthermore, the "error" in either case is greater, the more sharply diminishing or increasing returns, as the case may be, are acting.

¹ In general, $\int_0^x f_2(x) dx = x \cdot f_1(x)$.

² P. 175.

³ Pp. 174, 176, 177.

This means, of course, that in competitive industries of diminishing returns investment tends to be pushed too far, and in competitive industries of increasing returns, not far enough, to secure that equality of marginal net products which makes the national dividend a maximum. These conclusions lead naturally to the suggestion that the equality of marginal net products might be increased by appropriate taxes upon industries of diminishing returns, coupled with appropriate bounties upon industries of increasing returns.

When Professor Pigou passes to the consideration of monopoly he reaches results which are quite as interesting and important. The simplest case is that of a monopoly which has complete power in the matter of price discriminations, *i. e.*, power to charge a different price for each successive unit of output, so as to leave no consumers' surplus. Referring again to the diagram, it is clear that the increase of total receipts accompanying increasing output will be represented¹ by the increasing total area included between the curve DD' and the axis as the ordinate at M is moved toward the right, while the increasing total expenses of production will be represented by the area between the curve SS_2 and the axis. It is evident that the point of maximum profits will be fixed by the intersection of DD' and SS_2 ; so that the marginal net product is equal to "the marginal net product of resources invested in industries in general." "In cases of constant returns the result is exactly the same as that attained under simple competition, but in cases of diminishing and of increasing returns, that it to say, in the generality of cases, it is both different and socially more advantageous."²

In fact, of course, no monopoly possesses this complete power of discrimination. Very frequently a monopoly must sell its product at a uniform price; in other cases it may be able roughly to classify its customers or its products or services into a number of grades, charging a separate price to each group of buyers. It might naturally be inferred that such monopolies, altho falling short of the standard of per-

¹ Subject to some qualifications which do not affect the result.

² P. 206.

fection set by the hypothetical monopoly with ideal powers of discrimination, would, nevertheless, be apt to set their marginal investments somewhat nearer the socially desirable point of equal net products than would competitive concerns in industries of diminishing or increasing returns. But Professor Pigou shows, in a careful analysis,¹ too lengthy to be summarized here, that such will not, in general, be the case.² Thus competition is again awarded the primacy, altho it emerges with a less perfect score than in former reckonings.

I now pass to the discussion of the validity of some of the conclusions just outlined, but I do so with some hesitancy, especially in view of the fact that in regard to certain results which I find difficulty in accepting, Professor Pigou's own weighty authority is reinforced by the no less weighty approval of Professor Edgeworth.³ I do not, of course, deny the significance of the "curve of marginal supply prices." Professor Pigou's own work shows it to be a powerful aid in the analysis of the tendencies of monopoly. It might also be used advantageously, I imagine, in the discussion of certain problems relating to the *distribution* of the national dividend, But I fail to see that its use is appropriate in the analysis of the extent to which competition tends to secure the maximum national dividend.

A possible difficulty (altho a minor one) is attached to the meaning of the "marginal net product in industries in general," which Professor Pigou postulates as the standard to which the marginal product of particular industries should conform. If it is true that only the relatively unimportant

¹ Pt. II, chs. xi, xii.

² Professor Pigou makes an important application of this conclusion in his discussion of railway rates (in Pt. II, ch. xiii). The important aspects of his treatment of this question have been ably reviewed by Professor Taussig in the *Quarterly Journal of Economics*, May, 1913, and by Professor Edgeworth in the *Economic Journal*, June, 1913, and will not be discussed here. With reference to the controversy between Professor Pigou and Professor Taussig, I may say, however, that I see no inconsistency in granting both Professor Taussig's contention that railway costs are largely joint costs and Professor Pigou's contention that railway rates form a special case of discriminating monopoly price. [See also Professor Pigou's note in the present issue of this Journal. — *Editor*.]

industries of constant returns tend to meet this standard, while industries of increasing returns tend to exceed, and of diminishing returns to fall short of it, what is the marginal net product of industry in general? It might possibly be conceived as a general average of actual net products, were it not that industries of diminishing returns (in the sense of increasing aggregate expenses per unit of product in the industry at large) are probably much more important than those of increasing returns, and the extent of deviation from constant returns larger in the case of diminishing returns than of increasing returns. I do not stress this objection, however, for the existence of an ideal standard is easily possible, even if the marginal products of actual industries do not in general tend to approach it.

A more serious difficulty appears when we inquire as to the precise content of the "resources" which are devoted to the work of production. Is equality of marginal aggregate expenses the equality which we have in mind when we say that the maximum product will be achieved when marginal net products are equal? Does Professor Pigou mean by the term "resources" the services of labor and capital which are used up in production or does he refer to the money expenses of entrepreneurs? Examination shows that his use of the term is not altogether consistent. In his general discussion of production and distribution¹ he states that the factors of production consist of the services actually used in production.² Nor is there any indication that in the following chapter, in which is developed the proposition that "the more nearly equal marginal products in all uses are, the larger the dividend is likely to be,"³ there is any change in the meaning attached to "resources." But in the description of the curve

¹ Pt. II, ch. ii.

² "For our purpose it is convenient to divide the factors of production, from whose joint operation the national dividend results, into two broad groups, labor and the factors other than labor, or, as we may say for brevity, non-labor. . . . Labor embraces the work both of unskilled casual workpeople and of numerous sorts of skilled artisans. Non-labor embraces, along with the work of Nature, the work of many kinds of mental ability, the service of waiting and the service of uncertainty-bearing" (p. 79).

³ P. 108.

of marginal supply prices,¹ altho Professor Pigou continues to speak of the "investment of resources," and the "net product of resources" it is clear that he has in mind merely the aggregate money expenses of entrepreneurs.

For illustration, take again the example of industries of diminishing returns. The significance of the curve of marginal supply prices consists, it will be remembered, in the fact that the expense of producing $x + \Delta x$ units exceeds the expense of producing x units by more than the amount of expenses specifically incurred in producing the additional Δx units. This excess cost is due to the fact that increased production is only possible at an increased price per unit for the product, which makes possible and necessary an increased annual price for the land (and, under some conditions, for other resources) used in production. This is not a case, it is important to note, in which the money measure of a given quantum of resources can, in order to simplify the analysis, be supposed a constant. Changes in the prices of product and of resources are the very essence of the situation. Increased prices for the use of land and the other factors in production do not represent an increased *using up* of resources in the work of production. They merely represent *transferences* of purchasing power. The resulting changes in distribution may, of course, indirectly affect production, but Professor Pigou's discussion of the curve of marginal supply prices is not concerned with these indirect effects.

To have achieved consistency Professor Pigou should have adhered consistently either (1) to the viewpoint of entrepreneurs' costs, and have measured *product* as well as resources in terms of price, or (2) to a more distinctly social point of view and have measured *costs*, as well as product, in terms of physical units.² In either case, I think, he would have reached a result more in harmony with the traditional theory relative to competition and the maximum product.

¹ Pt. II, ch. viii.

² Thus Professor Pigou might well have adhered, in the case of "waiting," to his own formal statement (p. 79, note): "The unit of waiting is the use of a given quantity of resources for a given time."

The second of these two points of view may seem to be the more significant, but it is impossible to adhere to it without encountering great difficulties in the analysis.

When, for example, one takes account, as Professor Pigou does, of the general fact of diminishing returns in an industry at large, one explicitly or implicitly postulates changes in the price of the product, and as soon as one does this it becomes impossible any longer to view the national dividend in a purely (physically) quantitative aspect. For (neglecting consumers' surplus) we have to admit that (on Professor Pigou's premises) a dollar's worth of one commodity is as important to society as a dollar's worth of another. Concretely: *when measuring the effect of diminishing returns* in agriculture upon the national dividend, we cannot assume that a bushel of wheat at 60 cents is as large a part of the dividend as a bushel of wheat at one dollar.

On somewhat different grounds, it can be shown that it is difficult entirely to avoid the use of a money measure for the "resources" devoted to the work of production. The maximum product will be attained, it is true, when the values of the net marginal products of equal *quantities* of *comparable sorts* of labor, waiting and other forms of productive energy are equal. But there is no way in which the proper apportioning of the different *kinds* of resources which contribute to production can be discussed, except in terms of a money measure.¹ The problem as a whole, it seems to me, is one to which the general theory of the diminishing productivity of individual factors in production is appropriate, rather than the curve of marginal supply prices.

Wholly admirable, however, is Professor Pigou's discussion of the various sorts of economic friction that tend to prevent the perfect equality of marginal net products.² But it is when he passes to such practical problems as those connected with purchasers' associations, state intervention,

¹ Unless we assume that the marginal units of the various sorts of productive energy represent equivalent amounts of ultimate cost or sacrifice, — an assumption which does not seem to me to be of significance for the analysis of actually existing conditions.

² Pt. II, chs. iv-vii.

public control of monopoly, and public operation of industries¹ that his rare judicial faculty of taking fairly into account the varied considerations that weigh for and against a given proposal is seen at its best. I have no space here even to summarize these admirable chapters, with their discriminating conclusions. Professor Pigou here, as elsewhere, has primarily in mind British national problems. I am inclined to think that a more intimate acquaintance with the recent work of American public utility commissions would have made Professor Pigou's conclusions as to the range and variety of the considerations that can be taken into account in the public regulation of monopoly prices and services somewhat more favorable.

In his discussion of the distribution of the national dividend² Professor Pigou deals almost exclusively with labor problems, and especially with "attempts to improve the distribution of the dividend by the deliberate transference of resources from the relatively rich to the relatively poor, first through interference with the natural course of wages and secondly through taxation, and so forth." In this field Professor Pigou is thoroly at home, and shows familiarity with an unusual range of modern economic literature. The problems he discusses are those suggested by recent labor union policies and by recent achievements and proposals in the field of social legislation, particularly in England. These chapters constitute what is beyond question the best discussion to be found anywhere of the economic principles involved in this new social program. The lack of an adequate treatment of the population problem is the only serious blemish on this admirable discussion.

Professor Pigou has in a rare degree the power of forcing his way through to some positive conclusion in cases where at first no conclusion seems possible. That many of his results are stated merely as probabilities is a testimonial as much to the courage with which the analysis is pushed through to the end as it is to the caution with which inferences are made.

¹ Pt. II, chs. xiv-xvii.

² Pt. III.

Nowhere do the advantages of the particular type of economic theory in which Professor Pigou is an adept appear more clearly. Theory of this sort (if I may characterize it briefly) is not concerned with the vain attempt to formulate concepts so general and abstract that the whole economic process may be viewed as a relatively simple mechanical system. The purpose is, rather, that the fabric of theory shall be a yielding garment, fitting the varied and complex reality of economic life as closely as is demanded by the criterion that the conclusions to which the theory leads shall be both useful and general.

The book is not without indications that it was put through in some haste. Typographical errors and small slips of one sort and another are more common than one expects in a book of dignity and importance. The most serious lapse of this kind which I have noticed is the loosely demonstrated statement¹ that Pareto's measure of inequality in the distribution of incomes gives results that are in general agreement with those indicated by the standard deviation. Applied to actual income statistics these measures are rather more apt than not to give precisely opposite results.²

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¹ P. 125.

² The more evenly income receivers are distributed throughout the income scale the lower will be Pareto's index, and the more closely they are concentrated about the average income the lower will be the standard deviation. Whether these two measures will agree in indicating that the distribution of wealth has moved in a particular direction will depend largely upon the difference between the modal income and the average income, together with the extent of the change. Tests applied to a number of typical cases indicate that disagreement is more probable than agreement.